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ABSTRACT

The first edition of this journal features seven papers on computers in special education. D. Berkell reviews basic information in "For the Uninitiated: What Teachers Should Know about Computers." D. Shanahan briefly describes a computer problem solving program in "Robots in the Kindergarten." J. Beckerman relates her own experiences using computers as instructional tools in "You Don't Have to Know the Language." The application of computers to administrative use is addressed by J. Mittler in "Computer-Assisted Management and Special Education." E. Cain, Jr. traces the evolution of a microcomputer program in his school district in "The Computer and Special Education: A School Administrator's View." J. Ammer describes classroom applications in "Computer Assisted Instruction: Practical Uses for Computers in the Classroom." In a final paper, "C. W. Post and Computer Education," H. Greene describes a proposal for a Master's degree in "Computers in Education." (CL)

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ISSUE TOPIC: COMPUTERS IN THE CLASSROOM

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COMPUTERS IN THE CLASSROOM

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The first edition of "Post Time" is one of many ventures that the Special Education Department of C.W. Post has made to foster closer working relationships with school districts. It is hoped that this mutual interaction can be of benefit not only to field based educators and university based personnel, but can also further the teaching and research capabilities of our profession.

In putting our feet and our intellects where the action and learning take place, we have chosen to feature for this first edition, the use of computers by the Commack School District, a district which pioneered the use of computers in 1977.

The topic of "Computers in the Classroom" was chosen to provide an opportunity for educational personnel, including teachers and university professors, to take a look at the phenomenon of the explosive growth of computers in our schools. Many questions are being asked, such as "Are we dealing with just a new fad?" "Is the novelty factor providing the motivation or is the teacher being given a most sophisticated analytical tool which he/she dare not ignore?" The opportunity for a marriage between teaching and dynamic educational research is also possible as the result of our abilities to collect, analyze, and store data which will help us to shape future teaching strategies.

I do believe that the varied backgrounds of the authors of this issue will do much to help us to take a closer look at the realities of the potential use of computers, not only in special education, but also in all areas of education.

The editors of this publication invite you to share your thoughts about this issue by writing to any of the contributing authors. Also, if your school or school district is involved in an educational activity in special education which should be highlighted and shared with other school districts, please write to: Dr. Albert Budnick, Chairman, Department of Special Education and Reading, C.W. Post Center of Long Island University, Greenvale, New York 11548.

FOR THE UNINITIATED: WHAT TEACHERS SHOULD KNOW ABOUT COMPUTERS

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Various strategies and tools have been employed by teachers in the effort to provide effective classroom instruction. One avenue, or instructional-tool, which is only beginning to be explored is the microcomputer. Few teachers know how to use computers; fewer know how to use them to teach children. While microcomputers have seemingly limitless possibilities as versatile and flexible tools for teachers, the widespread computer-illiteracy of teachers is a major obstacle in realizing their potential. Teachers lacking simple prerequisite computer skills are unable to incorporate successfully computer assisted instruction (CAI) into their programs. A basic overview of the microcomputer is herein provided so that teachers may begin to build a knowledge base in this domain.

Computer literacy constitutes a whole new philosophy in education which now, with the increased availability of computers in schools, must be considered an essential aspect of teacher competency. To gain computer-literacy, one must have a fundamental understanding of the computer, its impact on society, and its appropriate uses in education. To be adequately computer-literate, teachers must be comfortable and confident with the computer and with computer assisted instruction for children. The first step in this process of developing a feeling of assurance and comfort is to introduce oneself to the microcomputer and to find out what a computer really is.

By definition, the term microcomputer refers to a computer that costs roughly \$300 to \$6,000. The major computational capabilities are concentrated in one electric component called a "chip." The five fundamental functions of the major parts of the "appliance" microcomputer include a memory, keyboard microprocessor, videoscreen, cassette recorder, and disk. (Frederick, 1980).

The first of these five functions, the memory, allows you to temporarily store and use programs and data. The function of the keyboard is to enter programs and data. The microprocessor carries out the instructions contained in the program. The videoscreen allows you to see the results of the programs, and the cassette recorder permits you to save programs/data from computer memory for later use.

The computer is essentially a dumb device. It has no brains, but rather depends on a built-in set of actions which it can carry out. For each task which it performs, a list of instructions is required. Each instruction may require the computer to perform one or more of its built-in actions. If, by chance, the instruction list includes an error, the dumb device will blindly make the same error. Each list of instructions is referred to as a program. Most programs are prepared in particular languages, such as BASIC or PASCAL. These language coded instructions, or programs, comprise the computer "software"

and direct the operation of physical equipment of the computer system which is called "hardware."

Various microcomputer systems (e.g., APPLE II, CBM/PET by Commodore, TRS-80 by Radio Shack, and Atari 800) may use different languages and have different capabilities. Prior to purchasing any particular system the educator should determine the tasks for which it is to be used and should also check on the availability of software in this area.

When purchasing software, the user should have thorough knowledge of the task which the software is to perform. The purchaser should carefully review the operation of the software to see if it is compatible in every aspect with the job expected of it. Remember, just because the program has a title that sounds as if it can do a certain task, this doesn't mean that it can actually perform the particular task which the user has in mind. Check carefully and completely before you spend your district's money. Small differences between software and task assignments, by the way, can sometimes be remedied by program modifications.

Every area of specialization has its own vocabulary or jargon, and computers are no exception to this rule. Computer-related phrases, however, often appear extremely strange. Generally, educators have been unfamiliar with this computer jargon (Horn & Poirot, 1981). Many computer words are acronyms, or new words formed by combining the initial letters of several words from a phrase. The acronyms (e.g., UNIVAC) are so often used that the new word becomes a symbol for a thing, idea, or process. The uninitiated educator may thus find himself confronted with a barrage of strange terms, making an already intimidating encounter with unfamiliar electronic machines even more overwhelming.

At this point, the teacher must bear in mind that everyone who is now using computers had to begin from scratch, amassing knowledge and skill along the way. It is quite acceptable computer etiquette to ask questions. Some of the computer companies, themselves, offer mini-courses in the use of their particular systems. Courses are available at C. W. Post Center, and they are also frequently given within school districts. There is no reason why every teacher cannot become computer literate, but the only way to learn how to use a computer is to use a computer!

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Horn, C. E., & Poirot, J. L. Computer literacy: Problem-solving with computers. Austin, Texas: Sterling Swift Publishers, 1981.

ROBOTS IN THE KINDERGARTEN

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Kindergarten students at the Indian Hollow Elementary School in Commack are approaching problem solving tasks with determination and skill. These early learners are programming and controlling a robot with the ease with which they paint or build with blocks. The robot's name is BIG TRAK, a robot-like tank that moves along the floor following the commands programmed by the user. BIG TRAK moves forward, backward, makes right and left turns and shoots its "photon rays" upon request.

Behavioral objectives have been established for this exciting early learning/research project, and individual differences among the students are being monitored through personal records charting the number of trials needed to master each objective. The small kindergarten students play with the amiable robot on an individual basis, maneuvering the lunar-like object in several directions, even around corners.

One of the most fascinating experiences occurring with the children is in the area of estimation. For example, small cardboard chairs have been placed at strategic locations in a room with the task being to estimate the directions needed to instruct BIG TRAK to move to and/or stop at these chairs. Trial and error experimentation has occurred until the majority of students have been able to master this estimation objective. Imagine the joy and sense of mastery when the young learners actually zeroed in on solutions to these problems!

Following success with estimation, kindergarteners are asked to direct BIG TRAK to move through mazes constructed with classroom blocks. Although the initial mazes are quite simple, subsequent labyrinths become more complicated. Young learners may direct BIG TRAK to move forward, make right and left turns, back up, and move forward again until targeted exit points can be reached.

BIG TRAK is also able to move along a number line. Children control the robot as it proceeds along the number line ranging from -10 to 10. They add and subtract without ever using the terms and are actively and happily involved in a process which may all too soon be dulled by workbooks and ditto sheets.

YOU DON'T HAVE TO KNOW THE LANGUAGE

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Prior to June of 1980, I had not touched a computer keyboard. I was not then, and am not now, a programmer or a machine person by any stretch of the imagination.

Why then am I writing this article? Simply to demonstrate to other educators the great value of utilizing computers to enhance the learning process. The computer as an instructional tool has limitless possibilities and applications which even the most uninitiated teacher is capable of implementing. The story is one of success and great personal achievement, and one which may be readily duplicated by any non-computer trained educator.

The arrival of our PET microcomputer and Diablo printer generated a great deal of excitement in my junior high school Special Education resource room. Intuitively, I felt that the computer would be a valuable addition to our program because it appeared to be highly motivational, non-questioning and, above all, non-judgemental. Of still greater significance was the fact that this was an instructional tool with which my students had never experienced failure. We were, therefore, beginning from a success situation and unhampered by built-in frustrations and inadequacies due to past failures. Many of my colleagues were skeptical, but this skepticism was ultimately proven completely unfounded. The following is my students' story, which was truly their story and their success:

Step one in our get-acquainted process was significantly enhanced by three ancient manual typewriters discarded by the District's Business Education Department. These typewriters, used in conjunction with the simple Type-It program (Educators Publishing Service Inc.), enabled me to introduce the keyboard and to allow students the opportunity to locate letters and gain facility in putting information. We talked about computers, what they could do, and experienced giving commands through the use of hand-held computer games which some of the students brought to class. The next step in our orientation process involved recognizing that our PET speaks its own language (BASIC), and learning how to speak to it so that it could respond to us. When all the students could LOAD and RUN a program with facility, we began our quest to maximize our PET's potential as a serious instructional tool.

During the second phase of our process we used software which enabled the students to review basic math facts and skills, manipulate words in spelling and vocabulary type programs, and even practice eye-hand coordination, visual discrimination and focusing through the use of skill games. The students were required to read directions independently and, oft times, explain verbally how a program worked. They worked individually, in pairs, or in teams and competed with one another. As a result, they learned to respect other students and to be patient with themselves and others. All of these activities were carried on under the careful and constant direction of the teacher.

The student reaction was overwhelming. They clearly articulated their desire to learn to do more than merely utilize the software we had available.

Since we had a printer and word processing capability, a computer magazine containing graphics and articles was a natural. Thus, phase three was under way with students planning graphic designs (Snoopy, Ziggy, original designs, names of Rock groups, etc.) on quarter inch graph paper. Their task involved planning the design, numbering the graph paper, and visualizing and transferring the designs to the graph paper (one symbol to a box). They were reasoning, thinking and working with a degree of sophistication never realized before. The aforementioned is particularly true when the students began to transfer their designs from the graph paper to the computer screen. A simple print statement for output to the printer was readily learned and the students were programming. The students worked with partners and, quite unknown to them, they were practicing eye-hand coordination, visualizing, focusing, counting, spacing, and self-correcting errors. Above all, they were concentrating and enjoying a significant educational activity. At the conclusion of each session, the students would activate the printer, examine the output on paper, scrutinize it to determine if the output was what they intended, identify errors, and utilize a simple editing process to correct the errors. They would then store their products on tape. (This involved learning two additional system commands: SAVE and VERIFY.) The excitement, pride, satisfaction and pure joy the students experienced when their graphics were completed could never be adequately conveyed in words.

Phase four got under way when we loaded Word Processor I and our micro-computer functioned very much like an electric typewriter - albeit a very special electric typewriter. Prior to this, whenever I ventured to ask my students to write with pencil and paper, I was greeted by the usual grunts and groans. Suddenly this was changed because we were going to do it on the computer and their reward would be a perfect, book-like page of type. No more red-marked paper to write and rewrite because now we could make all the needed corrections with great ease and simplicity on the computer screen. Thus, still another success was realized when severely written expressive language impaired youngsters were turning out competent writing samples.

Many educational objectives were achieved and it was truly a total life experience for the students involved. If nothing else, they learned patience, understanding, a process to work things through and a realization that they too could be successful. The computers still comprise but one part of our total program. This story was in no way meant to demean what we did in the past, but to publicize the limitless value of the computer as a way to enhance a total program.

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COMPUTER-ASSISTED MANAGEMENT AND SPECIAL EDUCATION

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The application of computer technology within the area of education, especially that of the handicapped child, is obviously expanding at a rapid pace. The use of the computer as a teaching device where students interact with various forms of modern electronic machinery in an instructional situation has been called Computer-Assisted Instruction or CAI. There is, however, another application of computer technology that can be equally important in the education of handicapped children. This area has been called Computer-Assisted Management or CAM.

CAM applied to Special Education refers to the use of the computer to assist in the management of information and data that is generated within the operation of educational programs that service exceptional learners. Although the ultimate beneficiary of CAM are the Special Education students, it is the administrators, the teachers, and the support staff that are the immediate recipients of the advantages of CAM.

One of the more obvious uses of computers in the management of information is the maintenance of a data base of all Special Education students for administrative purposes. With one entry of all relevant information, the administrator can generate lists of students by classification, related services, program placement, and many other categories. An additional use of the computer to assist in the management of data is during the evaluation and placement phase. Reminders of deadlines can be generated by either date or type of evaluation while a comprehensive record of all such evaluations and their findings can be maintained.

Programs are currently available that assist in the development of the Individual Education Plan for each student. Although Special Educators are cautioned to fully investigate the benefits and drawbacks of the use of computers to prepare the I.E.P., clearly many of the purely informational requirements are available from an established data base. The data required to state the present level of functioning can easily be accessed and criterion-referenced devices are available to aid in this endeavor. The selection of goals and objectives can be done in a variety of ways. Through CAM, a school district can prepare and file its own curriculum that is available to all teachers within the district. CAM permits and assists in the organization and compilation of goals, objectives, evaluations, methodology, teaching materials, test items and staff resources in virtually any subject area. Modifications of such objectives and methodologies in accord with the individual requirements of the student are recommended. Further, programs are also available which access existing, published curricula. Individual modifications are again advisable to meet the individual capabilities of the students.

Perhaps the most exciting use of CAM is in the direct application to

instruction. CAM can relieve the Special Education teacher of many of the data keeping requirements that have become the hallmark of modern systematic instruction of the exceptional child. Employing a criterion-referenced assessment model, students can be assessed according to the programmed curriculum demands and are given drill and practice in areas in which they are found to be deficient. Current information relative to instruction is available to the teacher or administrator, including individual and group scores on the overall topic as well as on each lesson.

CAM programs are also available for use by teachers without the associated use of CAI. In these cases, the computer acts as the collector and organizer of data provided by the teacher on the basis of directed instruction. The teacher, in designing an instructional program, manipulates language, materials, prompts, correction procedures, reinforcements and other components and is primarily interested in the student's response to this instruction. CAM can allow the teacher to record various aspects of both the instructional procedures as well as the student's responses for later review and modification of the instructional program.

A final use of CAM that is currently available to all Special Educators is the accessing of information that exists in data banks across the country. Through the use of time-sharing procedures, educators can "talk" to others around the country, can do computer searches in educationally related literature, and more.

It is obvious that computer-assisted instruction will continue to be of direct benefit to handicapped learners in their instruction. However, it is also obvious that the potential benefits of Computer-Assisted Management to those that provide the services appears endless. The time saved through the efficiency of effort can be time spent directly serving the Special Education student.

THE COMPUTER AND SPECIAL EDUCATION: A SCHOOL ADMINISTRATOR'S VIEW

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The Commack School District is a suburban school district located in Suffolk County, New York. Over the past five years, we have become increasingly interested in computers as an asset in our provision of educational services for our handicapped students.

Prior to 1977, the district's only involvement in computers was limited to use of the BOCES/LIRICS system for teaching computer science in both high schools. BOCES/LIRICS is an instructional computer system jointly managed by the three Suffolk County BOCES. In the Fall of 1977, the Commack School District established a pilot Title IV-C funded project, Project CAL (Computerized Accelerated Learning), at one of its elementary schools. The goal of the project was to determine the effectiveness of using computers in an elementary learning environment.

There were few computer programs in 1977 which had been developed for young learners; therefore, Project CAL Title IV-C funds were used to pay gifted high school students to program learning activities for primary children. A district Resource Room teacher, Dr. Dolores Shanahan, created the learning activities, prepared program directions and specifications and evaluated the final programs until they were educationally appropriate. The Project CAL mini-grant produced several hundred multi-sensory, developmentally sequenced, interactive programs in the areas of Early Learning and elementary school Mathematics and Language Arts. These programs have been given to BOCES/LIRICS by the school district and are accessed by all 160 district users of the LIRICS system.

The project CAL experiment showed that computers could effectively be used in elementary schools. The district expanded the original Project CAL concept to all elementary schools by introducing microcomputers. Commodore PET microcomputers were purchased for all elementary schools through Title IV-B funds.

The lack of appropriate commercially produced computer software for microcomputers caused the school district to develop its own programs. Dr. Shanahan designed educational learning activities for all elementary age students, including the handicapped, and beginning with the summer of 1979, the district paid high school computer math students to program these activities onto the PET under the direction of Dr. Shanahan. The resulting programs were termed COMCAL (Commack Accelerated Learning).

Over one thousand school district administrators, teachers and specialists have visited the Commack schools to view its microcomputer programs since 1979. Many desired copies of the district's COMCAL programs. As a result of their comments and interest, the Board of Education established a non-profit corporation, COMCAL, which sells its microcomputer software to requesting school districts nationally. The profits from the COMCAL corporation are reinvested into the education of Commack students.

The microcomputer program of the elementary schools was expanded to the secondary schools in 1980. At that time, the school district provided word processing, floppy disc drives and printers for the PET microcomputers to the special education resource rooms in its junior high schools. Word processing and programming has been implemented at the junior high level with handicapped students in order to develop compensatory alternatives and enhance written expression skills. Mrs. Judith Beckerman, the staff member primarily responsible for the development of this program presented a workshop on this junior high school program at the 1981 New York State Association for Educational Data Systems (NYSAEDA) annual conference.

The introduction of the microcomputer program into the elementary schools and its subsequent expansion to the secondary school level resulted in a need for staff training. Initially, one resource room staff member from each school was trained in computer awareness and the operation of the Commodore PET microcomputer by Dr. Shanahan. However, the introduction of the PET into the schools resulted in general staff interest at all instructional levels to learn about computers. As a result, in-service courses have been developed and provided to interested staff in computer awareness, BASIC programming, advanced BASIC programming, word processing and creative calculating. Some two hundred teachers, teacher assistants and parent volunteers have availed themselves of one or more of these courses. An administrative training one-day workshop on computer education has also been developed.

The use of the PET microcomputers in the Resource Rooms of the schools had provided the district with an opportunity to see the positive effects of computer assisted instructional system and was begun in the 1979-80 school year. The district desired a system which provided long-range curriculum flexibility, as well as a management control system for teacher use and state reporting purposes. Houghton-Mifflin's Timeshare Corporation's (TSC) Computer Instruction Program with its software curriculum of STRIDE/DOLPHIN in reading, language arts and mathematics was selected as being the most applicable to the district's needs.

Two complete TSC systems were added in September, 1980. They were funded through a combination of EHA 94-142, ESEA Title I and school district funds. Each system provided a time sharing Hewlett-Packard 300 microcomputer, a 50 million byte disc drive, 32 interactive port connected to both video and hard copy terminals, printers, and the STRIDE/DOLPHIN software. All schools in the district and the local parochial school are connected to the two minicomputers via multiplex telephone lines.

All students grades 3-12 participating in remedial compensatory education programs and special education resource room and self-contained classrooms access these terminals for diagnostic and drill and practice computer assisted instruction on the terminals. Drill and practice in developmental skill content is provided in reading, language arts and mathematics (grade equivalents K-8) and problem solving (grade equivalents 3-6). Teachers select the purpose and time of each student's participation in the STRIDE/DOLPHIN program. Student progress records are maintained on the computer freeing the teachers from maintaining proper records. This data is used as the basis of the annual pupil progress reports submitted to the state. The staff also uses the system to print reports for parents and regular classroom teachers regarding individual student

progress. Approximately 1,800 students are involved in this aspect of the minicomputer program.

Resource room and regular classroom staff has had a continuing concern with the process of ongoing articulation regarding individual student progress in support programs. Therefore, the district undertook a correlation of all subject area textbooks used in the elementary schools to the STRIDE/DOLPHIN scope and sequence curriculums. This data is stored on the minicomputers and allows the resource room staffs to print specific text assignments for each pupil which can be used in the regular classroom program. This correlation has dramatically improved the articulation process. However, the participation of our special education students is selective and constitutes a planned learning activity incorporated by their special education teacher in the Individualized Education Plan (IEP). Young special education students begin their exposure to the computer with COMCAL programs on the PET microcomputer. All handicapped students in the school district are thus receiving on-going instruction in computer awareness and are able to use a computer terminal. It is believed that the ability of the population to achieve independence in an increasingly technological adult society will increasingly reflect their ability to operate a computer as a functional daily living tool.

The Commack School District has also demonstrated the use of computer technology with handicapped individuals in schools outside our district. School district staff and volunteer high school students began an experimental program with the Mill Neck Manor School for the Deaf during the 1979-80 year. The high school students were bused to the school and served as mentors to deaf students. The district provided PET microcomputers and COMCAL programs. This experiment showed to both the district's special education staff and the Mill Neck Manor teachers the potential of the computer as an instructional tool for the deaf.

The school district also initiated an experimental program with the physically handicapped during the 1979-80 school year. Students from the BOCES III physically handicapped program were selected and bused to the Commack Computer Lab located at the Indian Hollow school. Under the guidance of a BOCES computer assistant and district staff, students accessed programs in Math, Language Arts and advanced games of logic and simulations. Word processing was added and proved to be a vehicle which allowed non-linguistic students to quickly and accurately communicate with the hearing world.

Gifted/handicapped students from the BOCES III physically handicapped program were provided instruction in programming in BASIC on the PET microcomputer during the following year. These students subsequently acted as mentors to twelve classes of physically handicapped learners back at the BOCES school.

Besides the numerous visitors to our computer center, School District staff have provided numerous workshops and teacher training programs for other school districts in New York, New Jersey and Connecticut. These have included administrative awareness workshops, and specific teacher training programs for school districts. These programs have often been conducted at the site of the requesting school districts.

The Commack School District will make available to interested school districts and other educational institutions more detailed information regarding its programs upon request.

COMPUTER ASSISTED INSTRUCTION: PRACTICAL USES
FOR COMPUTERS IN THE CLASSROOM

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The most widespread application of computers in the classroom is computer assisted instruction (CAI). As the term CAI connotes, computers are available as auxiliary learning facilitators. To prevent computerware from becoming expensive closet clutter and to increase the efficiency and productivity of these machines, educators need a clearer understanding of the role that computers can play as learning facilitators.

Presently, CAI serves three primary functions: drill and practice, simulation of actual situations and tutoring. The majority of software packages available to teachers and the prepackaged programs which allow teachers to design their own lessons concentrate on the concept of drill and practice. The machine elicits a response from the student and provides feedback on the appropriateness of the response. The theory behind this approach is that the novel questions allow the student to experience a variety of samples of material learned in a structured student-teacher learning situation. This should improve the chances of mastery of new material and transference and generalization of a concept to a variety of situations.

The most amazing potential capacity of computers is to develop simulation activities. Automobile industry designers, military battle strategists and aviation flight trainers have developed the most advanced forms of simulators. In the area of academics, simulation offers the opportunity to provide 'real life' situations and complex problem-solving activities which can strengthen a student's cognitive thinking skills. The simulator elicits student performance and provides an endless variety of highly stimulating visual effects based on the probable outcomes of the student's response choice. Teachers can develop problem-solving tasks which aid students in developing a keen sense of the interactive relationships among learned information and events.

Tutorial programs are potentially the most powerful form of CAI available. As a patient tutor, the computer can teach concepts and skills based on the specific rate of learning and amount of information necessary for optimal student success. By carefully controlling the pacing of new information and varying the informational context, the computer can increase the chances of retention and understanding of concepts. This can become a potent special education tool in that the computer can analyze the types of errors a student is making and quickly alter the presentation to meet the student's immediate needs. This is a skill that printed texts cannot facilitate. Skills in programming will be needed by educators at this point because the machine is only as creative as the information that is programmed into its memory. Once the computer has the information, its memory bank can manipulate information and make decisions faster than the human teacher. Just imagine how long it would take you to make up five or ten worksheets for each student every day. Not only can the computer perform this task, but by analyzing student errors it

can increase the likelihood that the right ten worksheets are being used.

Deciding what material is best served by this approach takes careful planning. Presently the capability is there. The how to particulars are still on the drawing boards of the human mind. The computer is not a novel babysitter. To maximize its potential, CAI programming must be carefully thought out. Presently there are few answers but a lot of undocumented software. If CAI is to become a viable learning tool educators need to consider carefully the role of computers in the classroom.

C.W. POST AND COMPUTER EDUCATION

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C.W. Post has just sent a program proposal to the State Education Department for a Master's Degree in Science - "Computers in Education". As this masters is functionally related to all areas of elementary and secondary curriculum, it should appropriately give permanent certification status.

For those educators who already have a masters, there is to be an 18 credit specialization certificate program. This program is designed to prepare educators with the skills necessary to utilize computers and computing in education. As this country, and especially New York City and Long Island, moves into the Information Age, it is becoming critically important that educators be trained in information related skills. The role of telecommunications in our society is rapidly emerging, and the very heart of telecommunications is the computer. Educators completing this program will be trained to evaluate and select computer hardware and software, to write computer programs using either BASIC or Pascal (the two most frequently used computer languages used in education), to prepare computer-assisted instruction (CAI) using a CAI authoring language, to implement microcomputers in the school, and to use on-line data bases to obtain information. Furthermore, graduates should have a proficient knowledge of how and why computers and computing can be used in the educational process.

Graduates of this program will also be trained to understand the philosophical and sociological ramifications of telecommunications and computing in this new age so that they may be able to implement carefully and properly the effective use of this technology in education. It is true that the computer is the most powerful tool yet created for man's mind. Yet, if man is not sufficiently trained to use that tool, then he is fated to use it primarily as a plaything. In order for man to be so trained, educators must become trained themselves because computers in and of themselves will not instantly improve the educational process. If educators are not properly trained, computers will be nothing more than a more expensive way of continuing both good and bad practices. Since expenses in education currently are carefully scrutinized by those within and without education, it is incumbent upon all educators to make decisions about using computers in learning based on knowledge, skill and established pedagogy.

As Long Island, New York State, and this nation become more and more dependent upon high technology and its benefits, more people must be trained with skills applicable in this market. Long Island especially has a very active high technology industry base with more than 200 firms located between the New York City border and Hauppauge employing over 100 people each. Currently, over 50% of this nation's workforce is employed in information related fields. Skilled people are needed at many levels, from high school graduates to Ph.D.s. Long Island educators recognize this need and have requested training so that they might be better prepared to assist students in learning skills of the information age.

The C.W. Post Center School of Education has been specifically requested to provide such services by some of the superintendents of both Nassau and Suffolk counties and by many teachers in the area. The 1981 summer Computers in Education Institute attracted over 100 administrators and in 1982, 180 teachers and administrators took the Computer Institute. Furthermore, this program will provide a viable opportunity for many teachers to retrain themselves in a field very much needed in all schools today. In fact, special efforts will be made to attract just such teachers into this program because it is important that the concepts of computing be mixed with an established academic subject rather than as self-standing entities.



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